受験番号：24IPE014

問１）

1. An alternate current arc welding device comprising:

a welding controller;

a storage unit;

an alternate current frequency setting unit configured to set an alternate current frequency;

a reverse polarity period setting unit configured to set a reverse polarity period;

a calculating unit configured to calculate a straight polarity period and a reverse polarity period and output the straight polarity period and the reverse polarity period to the welding controller; and

a selection unit configured to select one of a plurality of outputs from the storage unit and output the selected output to the calculating unit, wherein

the welding controller is configured to apply a straight polarity base current that is lower than a peak current of the straight polarity period before polarity reversion at which the straight polarity period is completed, and apply a reverse polarity base current that is lower than a peak current of the reverse polarity period before polarity reversion at which the reverse polarity period is completed,

the storage unit is configured to:

(a) store a plurality of combinations of a straight polarity base ratio and a reverse polarity base ratio, the straight polarity base ratio being a ratio of a period when the straight polarity base current is applied to the straight polarity period, the reverse polarity base ratio being a ratio of a period when the reverse polarity base current is applied to the reverse polarity period, or

(b) store a plurality of combinations of a straight polarity peak period, a straight polarity base period, a reverse polarity peak period, and a reverse polarity base period, the straight polarity peak period being a period when the peak current in the straight polarity period is applied, the straight polarity base period being a period when the straight polarity base current is applied, the reverse polarity peak period being a period when the peak current in the reverse polarity period is applied, the reverse polarity base period being a period when the reverse polarity base current is applied, and

the selection unit is configured to select one of the plurality of combinations stored in the storage unit based on an inductance of a welding load.

問 2)

In a conventional monitoring system with a sensor installed at, for example, a gate of a parking lot, the system can detect a motor vehicle at the gate, allow a mobile robot to get to the gate where the sensor is installed, process images taken on the way to the gate, determine the body color of the motor vehicle, and send the information to a center. In this case, the monitoring system preferably takes the images in such a way as to obtain information useful to identify motor vehicles.

The parking manner of a motor vehicle, however, depends on, for example, the nature of a thief and the circumstances of a parking lot and thus cannot be anticipated. It may therefore be difficult for the mobile robot to take images of a motor vehicle to identify the body color of a motor vehicle.

For example, when the system is to take images of a motor vehicle with a color visible light camera to determine a body color, the color may be different between images taken in the daytime and image taken in the evening due to influences of sunlight. A white motor vehicle thus may be determined to be orange when taken in the evening. Further, unfortunately, even during the night, a color may be different from a visual impression of humans depending on light components from lighting devices installed in a parking lot and illuminated advertisement devices installed on outer walls of neighboring commercial facilities.

問 3)

When supercooling cancellation is detected, the food temperature Th_2 immediately after the supercooling cancellation is equivalent to the freezing point of the food item. Based on this temperature, the target temperature Tc_set in the chilled room lower container is set to a temperature at which ice crystals can be melted to a degree without cellular damage, e.g., Th_2+2 °C (S9). A refrigerator setting temperature that allows ice crystals to melt to a degree without cellular damage is referred to as an ice crystal melting refrigerator temperature.

Then, when the melting of the ice crystals generated in the food item is completed and the food temperature begins to rise, the target temperature Tc_set in the chilled room lower container is maintained at Th_2+2 °C until, for example, the food temperature Th rises to a temperature Th_2+1 °C at which whether ice crystals have melted is determined, the temperature Th_2+1 being lower than the ice crystal melting refrigerator temperature (S10). In order to create this situation, the temperature in the chilled room lower container is raised by, for example, keeping a damper fully closed. When the food temperature Th becomes Th_2+1 °C or more after the supercooling

cancellation, checking for introduction and cancellation of supercooling is continued with the control of S1-S8 again.